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Testing the Waters in South Korea

Internationalization of Sea & Sun Electronics to the South Korean Market

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ABSTRACT

Sea & Sun Electronics, a German developer and manufacturer of water measurement instrumentation, has successfully leveraged worldwide growth in the market by expanding its international operations. As recent expansion has taken place in Asia, the purpose of this work project is to identify the next Asian target market for Sea & Sun. A scoring model, taking into account relevant macro and micro-criteria, proposes South Korea as the most attractive country. Further, direct exporting via a domestic sales agent is found to be the most appropriate entry mode to South Korea. These findings are complemented by a financial and risk analysis.

Keywords: Sea & Sun Electronics; Internationalization; Water Measurement; South Korea

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INTRODUCTION

Sea & Sun Technologies is the only German manufacturer of water measurement solutions and currently on a strong growth path. In order to achieve its sales objectives, it seeks to further internationalize its water measurement instrumentation business. Past internationalization has mainly taken place in Europe and recently in Asia. Past growth was mainly driven by unmet demand and inquiries in foreign markets. However, the firm is now proactively searching for new opportunities and markets to extend its business and increase sales, as a major Chinese investor just acquired a 20% stake in the company and thus provides Sea & Sun with additional equity to build a production facility in China. The company's current goal is to further internationalize on the Asian continent, due to high market potential arising from environmental issues and increasing wealth.

Therefore, the purpose of the present work project is to identify a suitable next market in Asia for Sea & Sun to extend its international operations as well as the respective entry mode, considering the firm's resources and capabilities.

To do so, the next section provides an overview of relevant literature on the topic of internationalization and introduces relevant theories and models used to identify and enter foreign markets. Afterwards, the methodology used in this report is presented, followed by an internal and external analysis of the company, including its competitive advantage, the SWOT-TOWS framework and the company's organizational readiness to internationalize. In order to find the most suitable market, preliminary elimination and country ranking are applied next. Later, an in-depth analysis of the selected country is presented, followed by the suggestion of an entry mode as well as a financial and risk analysis. Finally, a summary of the findings and recommendations for international expansion are given.

LITERATURE REVIEW

The majority of studies defines "internationalization" as geographic expansion of a firm's economic activities across national borders (e.g. (Johanson & Vahlne, 1990; Shenkar & Luo, 2004; Turnbull & Valla, 1986). Ruzzier et al. (2006) identify five major theories regarding the internationalization process of SMEs. The **Uppsala Internationalization Model** (U-Model), elaborated by Johanson & Vahlne (1977), is one of two primary stage models. It describes SME internationalization as an incremental process in which firms gradually expand their international activities, passing through several distinct stages, based on a company's knowledge about foreign markets' characteristics (state aspects) and its resource commitment to foreign activities (change aspects). Hereby internationalization starts with foreign markets at lower psychic distance and the firm's evolvement within these markets before entering markets with greater differences in culture, politics and economy as their knowledge evolves (Johanson & Vahlne, 1977). The second major stage model is the **Innovation-related** model, which defines each of the consecutive stages of a firm's internationalization process as an innovation in which the higher management as well as individual learning are essential aspects (Ruzzier et al., 2006). The **network approaches** consider a firm to be part of a network of other firms, customers, distributors and suppliers, all being interconnected through business relationships. Therefore, a firm has to consider not only its own capabilities and goals when operating internationally, but also its international environment comprising the other players of the network (Ruzzier et al., 2006; Whitelock, 2002). The **Resource-based approach** highlights the importance of unique, inimitable and sustainable resources of a firm for its ability to create a competitive advantage as well as to attain and defend a profitable market position. In the context of firm internationalization, this comprises intangible resources based on organizational knowledge and learning (Ruzzier et al., 2006). However, the so-called **born globals**, which are new ventures that are international from inception and see the world as their marketplace, poses a

challenge to these traditional models. These firms skip various internationalization stages and start their international involvement soon after their founding (Madsen & Servais, 1997; Oviatt & McDougall, 2005). The U-Model best matches Sea & Sun's approach to internationalization as the firm has first expanded its business to physically close countries in Europe and has then proceeded to internationalize to more distant countries with the knowledge gathered from past operations.

As markets differ in terms of attractiveness, **evaluating foreign market opportunities** to identify markets with the highest potential is an important task for a firm's management (Cavusgil et al., 2004). Various models in the literature suggest a **three-staged screening process** (Cavusgil, 1985; Kumar et al., 1994; Root, 1987): (i) preliminary screening uses macro-level indicators to identify and eliminate foreign markets that do not bear sufficient potential for the firm. This can be done by ranking countries with regard to criteria that are of particular relevance to the internationalizing firm. This way a reduced number of attractive target markets is found; (ii) an analysis of the industry market potential, where the aggregated demand for each potential target market is assessed on the basis of industry-specific information; and (iii) an analysis of the company's sales potential, where firm-specific data is consulted to identify the market with the highest potential.

Selecting the most suitable **entry mode** to enter the chosen market is another critical strategic decision (Agarwal & Ramaswami, 1992; Hill et al., 1990; Terpstra et al., 2012). International entry modes are described as institutional arrangements that determine how products or other resources of a firm enter a foreign target market (Root, 1987; Shenkar & Luo, 2004). The literature broadly distinguishes three different types of market entry methods (Cavusgil et al., 2014; Wall et al., 2010): (i) export-based methods describe a firm's strategy of continuing production in the domestic market, but selling parts abroad. A firm can choose to either export its goods directly to customers in foreign markets or to outsource the exporting activities to an intermediary party in the home

country (Shenkar & Luo, 2004); (ii) non-equity-based entry modes define the transfer of a firm's intellectual property under a contract to a foreign partner and typically take the form of licensing or franchising (Cavusgil et al., 2014); (iii) equity-based market entry methods involve the firm's equity, resulting in ownership of production facilities, subsidiaries, or other assets in the host market (Shenkar & Luo, 2004). Hereby, a company can enter the market on its own (sole venture) or partner up with another firm, based in the target country (joint venture) (Root, 1987). All strategies bear benefits and disadvantages as they require different levels of managerial and financial resource commitment and offer differing degrees of control, flexibility and risk to the firm (Driscoll & Paliwoda, 1997; Kim & Hwang, 1992; Kumar & Subramanian, 1997) (Appendix 1).

METHODOLOGY

The data for this report was collected from July to December 2016 through both, primary and secondary research sources. Six semi-structured interviews with Gerhard Pohl, COO of Sea & Sun Technologies, were conducted over a period of four months to gather qualitative as well as quantitative information about Sea & Sun Technologies. This way information about the company's history, products, values and operations were obtained. In addition to these insights provided by the firm, secondary resources such as scientific textbooks and journal articles as well as databases such as, Statista, The World Bank and the OECD library were consulted.

INTERNAL ANALYSIS

Company Overview

Sea & Sun Technology is the only German manufacturer of equipment for water measurement and was founded in 1998. By the definition of the OECD it is a small enterprise as it employs 27 employees and annual sales of 3 million € in 2016 (OECD, 2016). Despite its small size, Sea & Sun is one of the major players in water measurement solutions worldwide, due to its solid reputation

and the third largest market share in the market. Today, the firm operates two business areas, the major one being the development, manufacturing and distribution of highly technological water measurement equipment. At present this business area contributes to 100% of annual turnover as the second area, the biotechnological production of microalgae needs further development and does not generate any sales up to now. The microalgae will be used for fish food as well as to produce valuable oils, food supplements and medicine. After the completion of their development sales are expected to skyrocket, as there are several fields of application and production provides large value added. Before 2014, the firm's main business used to be the distribution of photovoltaic panels and related services. But when subsidizations of the German government were announced to be heavily reduced in 2012, sales decreased strongly (Appendix 4). Therefore, this report will focus solely on the revenue generating business area of water measurement equipment, which employs 24 of the 27 employees of Sea & Sun. In addition, a major state-owned enterprise from China just bought a 20% stake in this business area in January 2017, after negotiations of 6 months. As the Chinese company holds an exclusive license to build 20,000 new sewage-treatment plants within the next 10 years, the firm was looking at a viable business partner to monitor water quality and to invest in. This provides Sea & Sun with new equity and a strong increase in sales as each of the plants will require between 10 and 20 probes. Sea & Sun operates three segments within water measurement equipment business: (i) measuring probes holding several sensors and thereby allowing data collection of a wide range of biological, physical, and chemical parameters, including water pressure, temperature and pH-value as well as salt content and cloudiness, of both sea and fresh water, (ii) specialized software for data recording, processing and evaluation, and (iii) other equipment such as manual and electric winches to lower the probes into water and pull them out again. However, 90% of sales are generated through the measuring probes segment. The company's **product portfolio** consists of two broad types of probes, multiparameter and microstructure probes (Ap-

pendix 2). The probes are used to monitor oceanographic developments, wastewater and quality of drinking water as well as to explore the deep sea and large lakes. They carry up to 12 sensors, bundle the measurement information provided by the sensors, and send them to the receiving device. The probes are sold for between €5,000 and €100,000 whilst their gross margin is considerably high since cost for material only comprises 28% of overall production cost. All products are developed and manufactured at the firm's headquarter in Trappenkamp, Germany. The facilities also include a calibration laboratory, since probes have to be calibrated every 2 to 3 years.

Currently, there are three groups of **customers**: (1) **government-funded researchers**, either working at universities or research institutes with water related research fields (**80%** of sales), (2) **navies** worldwide (**15%**), and (3) **private customers** (**5%**) such as oil companies monitoring their underwater oil pipelines or searching for undiscovered oil resources in the sea. Also, wastewater treatment plants and other corporations in need of defining the quality of water. Further, the company is a partner and supplier of several environmental research programs (Appendix 3).

The firm is located close to major customers in the North of Germany, comprising research institutes and universities doing research with regards to the sea and fishing at the Northern and Eastern sea. The site is also located closely to **suppliers**, which are all within a 200km radius of reach which facilitates communication and production of individualized products. Further, **distribution channels** mainly comprise its sales forces visiting scientists and summits, presenting the products and giving lectures on related topics. Sea & Sun also presents its product portfolio at certain trade fairs. In Germany the firm distributes its products itself. In foreign markets, cooperations with sales agents are in place. In addition, Sea & Sun operates a sales subsidiary in France, the most important European market next to Germany, due to large sales volume, and as experience has shown that French customers are reluctant to buy products from German sales people.

The company has faced difficult times as the major equity holder and managing partner left the firm on account of death two years ago (NewEurope, 2014). This and stopping the decreasingly profitable solar business have forced Sea & Sun into a shrinking process to save the company. Thereby, sales went down by 37.5% from 2.4 million € in 2014 to 1.5 million € in 2015. However, after heavily reducing the number of employees and refocusing the firm's main business, Sea & Sun is recovering, profitable again and expected to grow strongly in the next few years (Appendix 4). Accordingly, variations in the quantity of products sold have been reported (Appendix 5). Also, Sea & Sun expects the new business partner from China to require several thousand probes per year in the next ten years, as well as calibration and maintenance services beyond that time. As current capacity only allows for production of 600 probes per year, the firm plans to build a production and calibration facility in China in the next 3 to 5 years. An experienced manager has already been hired, who has set up similar facilities in China. With these plans ahead, Sea & Sun expects to generate sales of 6.8 million € in 2017 and sales are forecasted to grow at 48% CAGR to reach 22 million € in 2021 in the conservative business case, or to grow at almost 100% CAGR in a more optimistic case to reach just over 100 million € in 2021 (Appendix 4).

Sea & Sun started its first **international operations** in 2006. Today, the company operates a sales subsidiary in France and exports to Italy, Norway, Sweden, Croatia, Poland, Turkey, China, India, Indonesia, Japan, Iran and the Philippines. It thereby generates 50% of total sales abroad. Current market share is 5% in its German home market and 0.5 to 2.5% in international markets. Next to further expanding internationally, one of the firm's main goals is to reach 20% market share in Germany by 2022. Sea & Sun's internationalization strategy currently focuses on Europe and Asia. However, in the medium to long-run it also plans on entering the North-American market to challenge its main competitor and world leader in its home market.

Market Overview

Industry definition: The subordinate industry in focus is the precision instruments industry, which comprises cameras, clocks, office automation equipment, medical equipment and any sort of measuring equipment. The latter includes products which can measure various geometric or physical parameters and produce quantitative results about the indicator. Sea & Sun operates in a sub-category of that segment, namely in the water measurement instrumentation market. This market has a global industry size of $1.57 billion. It is expected to reach $1.86 billion in 2017 and to keep growing to $3.6 billion in 2020 (CAGR of 25%). Currently, Europe is the largest market at $0.61 billion. However, the Asia-Pacific region is expected to be the fastest growing market at a CAGR of 12.9% from 2015 to 2020 (Appendix 6).

Market drivers: Demand for products from the water analysis instrumentation industry is driven by the increasing need to test water quality in a variety of sectors such as for residential, commercial and industrial use. Due to strong **population growth** and **industrialization**, resources of water have been contaminated while demand for clean water is rising. These challenges have been widely recognized and many countries have installed **stringent regulations for water quality control**. Especially in developing countries demand rises strongly due to high population growth and the creation of **drinking water supply infrastructure**. Further, an overall **trend towards large-scale monitoring** is evolving. The need to create integral knowledge of our environment drives demand of measuring instrumentation of all sorts. Also, the market has been changing and is still evolving due to **advanced technology**, e.g. the possibility to test multiple parameters with the same instrument instead of using one instrument per parameter. Another example is the simplified data transfer from the instrument via Bluetooth or an USB connection. Such innovations in product and usage simplification help **encourage adoption among end-users** (Global Industry Analysts, 2015).

Porter's 5 Forces: According to Porter (2008), five forces determine industry profitability and enable the identification of significant changes and trends. A detailed analysis for the market of water measurement instruments (Appendix 7) suggests the industry to be very profitable and therefore attractive. However, all forces except for buyer power are expected to increase in the future which might decrease industry profitability and attractiveness. A summary of the analysis is presented in Figure 1.

Figure 1 –Porter's Five Forces Analysis of the Water Measurement Instrumentation Industry

Internal Rivalry (Low) *increasing*	• Very low number of players in the world market • Only three companies operating internationally and being able to compete in technology and quality with world leader • Increasing global market size is likely to attract new entrants to the market
Power of Suppliers (Moderate) *increasing*	• Four types of major suppliers with different degrees of bargaining power • Suppliers of titan parts, electronics like circuits and software have very low industry concentration and high numbers of players in the upstream market which leads to low bargaining power • Suppliers of sensors are monopolists in their specific field and have very high bargaining power
Power of Buyers (Low) *decreasing*	• Majority of buyers (80% research institutes and universities, 15% navies and fishery) is dependent on research budgets allocated by governments • Customers not price-sensitive and buy at list prices, but have high requirements on products • High switching costs and low number of alternatives
Threat of Substitutes (Low) *slightly increasing*	• Currently no substitutes available • No substitute products expected to emerge within the next ten years
Threat of New Entrants (Moderate) *increasing*	• Entering the industry requires substantial capital resources, sophisticated technology and highly specified know-how, the latter being relatively difficult to access • New entrants have to build up reputation for their products to compete • Sourcing of resources and components and distribution of products is fairly easy • Predicted growth of market and large potential in fresh water segment might attract new entrants

Competitive Landscape

Sea & Sun's direct competitors are manufacturers of instruments for water measurement worldwide. Firms mainly compete on product characteristics such as the probes' size, quality of materials, connectivity and the technology used. The market leader and largest player is Sea-Bird Electronics with around 200 employees. The firm was acquired by the conglomerate *Danaher* in 2008

and is based in the US. It has sales representatives in 29 countries on all continents and reaches a market share of 50% and more in most markets. Due to its size and penetration of the market, Sea-Bird Electronics currently sets the world-standard in the water-measurement market. The second largest player in the market is RBR, with around 50 employees. The company is based in Canada and exports its products to 24 countries, also on all continents. However, both firms are willing to handle sales directly, if requests are made from countries without sales representation. Also, both focus mainly on test probes for the ocean and therefore on salty water, in contrast to Sea & Sun which serves both, marine and fresh water measurement systems. Together with Sea & Sun, these are the only internationally operating players in the market. Additional 25 players are small regional firms that serve specific national markets. Their products either cannot compete with the three main players' or are highly specialized on specific measuring fields.

ANALYSIS OF COMPETITIVE ADVANTAGE

Key success factors: After identifying the current profitability of the industry and its prospects, the factors driving the individual firm's success in the market are to be identified. There are three major factors driving a firm's success in the water measurement industry: (1) the ability to **develop innovative products of high quality**, that serve individual requirements of customers and work accurately; (2) the availability of **calibration laboratories** and **technical support** are crucial as precise results are highly important to customers. Further, research projects are very costly and each day prolonging a project is expensive, therefore customers require the manufacturer to solve possible issues as quickly as possible. (3) a good sales department with **close relationships** to major customers, that holds extensive presentations of the products' technological features, as buyers have a high involvement with the products.

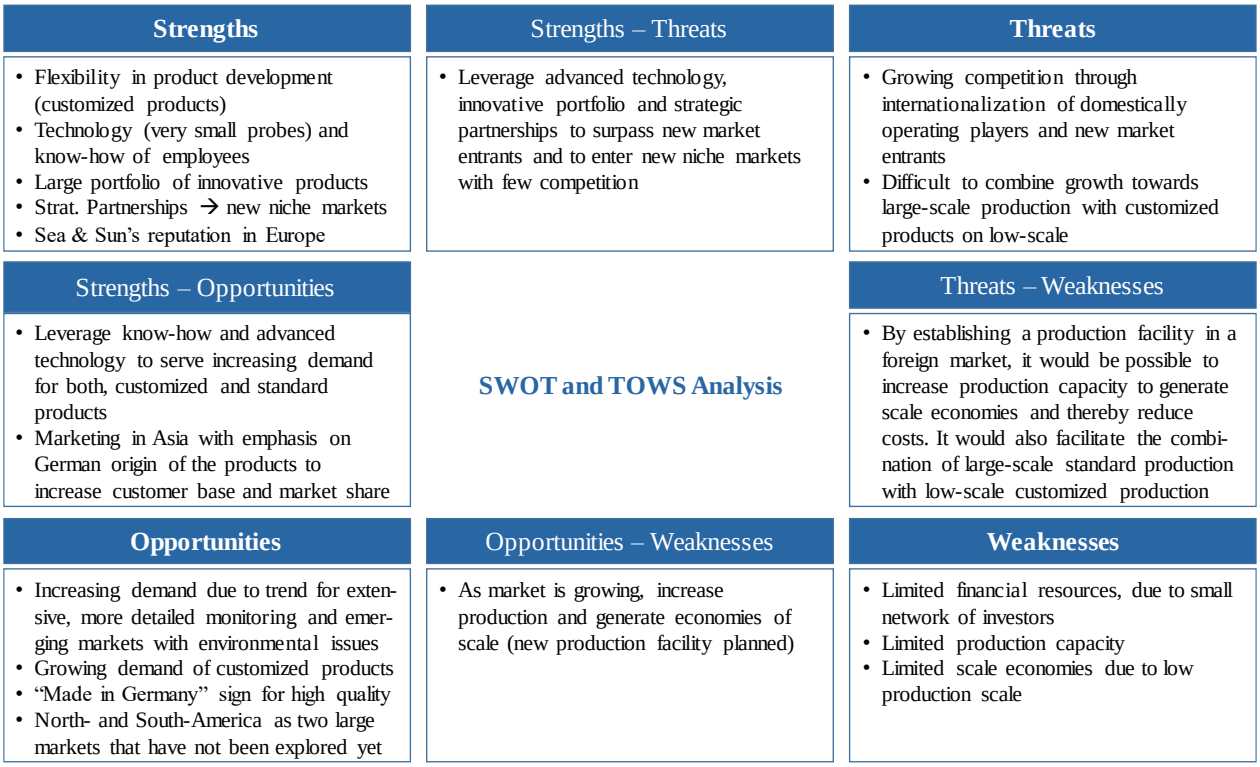
Organizational resource platform: In order to identify Sea & Sun's key strengths, its organizational resource platform was assessed with regards to Sea & Sun's relative strengths in these fields and their strategic importance in the industry (Appendix 8). The analysis identifies the employees' **specialized know-how**, the firm's **new product development** and its **strategic partnerships** as Sea & Sun's key strengths.

As all three key strengths are valuable, rare and organizationally embedded, they provide a **temporary competitive advantage**. However, competitors are able to hire highly knowledgeable specialists at costs that would still allow them to generate abnormal returns, due to the high demand and high selling prices of measuring probes. They are also able to engage in establishing partnerships with private or governmental organizations in their home and foreign markets. Further, a competitor like Sea-Bird Electronics possesses the resources to strongly invest in new product development, if the demand for such arises. This shows that Sea & Sun's key resources are imitable, substitutable and transactionable. Thus, its competitive advantage is not sustainable, but threatened. However, Sea & Sun's management is aware of that fact and faces this by making sure to fully support their technicians and leaving them enough space for creative research. This way Sea & Sun is able to constantly improve and innovate its products or even develop new product types. Also, one of Sea & Sun's major competitive advantages is its flexibility due to low hierarchical structures and a small back office, resulting in lower prices for technologically more advanced products than its competitors'.

SWOT AND TOWS ANALYSIS

The previously conducted internal and external analyses are summarized in the following SWOT-analysis, enriched by a TOWS-analysis. This way is examined, how Sea & Sun can take advantage of opportunities while minimize threats by exploiting its strengths and overcoming its weaknesses.

Figure 2 – SWOT and TOWS Analysis



READINESS TO INTERNATIONALIZE

Sea & Sun already engages in exporting activities to several foreign countries. Yet, its current internationalization readiness had to be evaluated, using the CORE™ tool, which evaluates a firm's readiness to engage in exporting activities, based on 70 questions of six categories. Thereby, a firm's organizational resources, also in comparison to competitors, are examined, taking into account the internal and external analyses presented above. With an overall rating of moderate readiness to internationalize, Sea & Sun seems to be in a suitable position to further internationalize its business (Appendix 9). However, with exports to 22 countries and the current market entry in the Chinese market, Sea & Sun's management is faced with different cultures and new challenges. It should therefore approach new markets well-informed, with previous training if possible.

Sea & Sun's urge to further internationalize has long been driven by increased inquiries from foreign markets. As the company is recovering from a crisis, it is a good time to expand as the number

of players in the market is still very low while market size is growing. Therefore, Sea & Sun actively seeks to expand, aiming to enter 3 new markets in Asia within the next 5 to 7 years.

COUNTRY SELECTION

Following Cavusgil (1985), this section presents a preliminary screening of foreign markets in order to determine the overseas market with the best potential for Sea & Sun. As outlined in the Literature Review, it comprises a three-step approach starting with preliminary screening, followed by analyses of the industry's market potential and the company's sales potential. For the first step, two screening techniques are applied: (i) **preliminary elimination** uses macro-level indicators to identify those foreign markets that are unsuitable for Sea & Sun's market entry and eliminates them from the initial set of countries. Then, (ii) **country ranking** is applied, sorting the remaining countries according to their overall market attractiveness measured by relevant macro-level variables and industry-specific indicators. The country with the highest rank will be Sea & Sun's new target market to expand its business, unless the following in-depth analysis of the country will reveal characteristics, that proves it to be unsuitable after all. This method will be applied to an initial set of chosen countries. As Sea & Sun already sells its products in China, India, Indonesia, Iran, Japan, Philippines and Turkey, the company seeks to expand its operations on the Asian continent. The market size and more importantly the market potential are very attractive on the Asian continent, because most of the countries just started to act against their strong environmental issues, especially the quality of ground and drinking water. Therefore, this geography offers great opportunities for Sea & Sun. Thus, the remaining **44 countries in Asia** were selected for this study.

(i) Preliminary elimination

In order to determine those countries whose economic and political development is considered to be relatively unstable and bear potential risk for foreign firms' investments, two indicators were

applied: The **Index of Economic Freedom** and the **Country Risk Rating**. At this stage, countries were eliminated from the analysis which (a) are categorized by the Index of Economic Freedom to be *repressed* (Index below 50), or (b) have a Country Risk Rating below C (below C risk is considered to be high). In addition, all countries with an **Urban Population** below 5 million were eliminated from the set, since universities, industry and sewage-treatment plans (potential customers of Sea & Sun) are more likely to be found in urbanized areas. This preliminary elimination process reduced the initial set of 41 Asian countries, in which Sea & Sun is not operating yet, to merely 11 countries, namely Azerbaijan, Israel, Jordan, South Korea, Malaysia, Russia, Saudi Arabia, Singapore, Thailand, United Arab Emirates, and Vietnam (Appendix 10).

(ii) Country ranking

To assess the market potential of the remaining countries, comparable macro- and micro-level indicators were used (Appendix 11). **Macro-indicators** incorporated into the ranking are: (1) the **Index of Economic Freedom** determines the degree of freedom of a country's market structure, based on ten quantitative and qualitative indicators. Special focus is given to (2) **trade freedom**, which expresses the presence of tariff and non-tariff barriers to trade and therefore influences the success of exporting operations; (3) **country risk** indicates the relative probability of certain changes, that negatively affect profitability or assets of a firm. It takes into account political, economic, sovereign and transfer risk, as well as (4) **foreign exchange risk**, which is of special importance to exporting activities. Further, the following **micro-level indicators** were used: (5) **urban population** is used as an indicator for the likelihood of potential customers being present in the market; (6) The **cumulated growth rate of the population** determines the percent change in population, resulting from births and deaths as well as migrations to and from the country. It is used as an estimate for the likelihood of a country having environmental issues like contaminated

rivers and ground water. A high growth rate indicates higher probability for such conditions. In order to reflect long-time development and speed of population growth, the years 1960 – 2015 are examined; (7) **gross domestic spending on R&D**, as total expenditure by companies, research institutes and universities as well as (8) **number of researchers**, are indicators for market size, as researchers are the main customer group whose buying power strongly depends on budgets allocated for research; two variables measuring potential in the water sanitation market are the **percentage of the population using** (9) **improved drinking-water sources** and (10) **improved sanitation**. They show how well the water-related infrastructure is developed and thus provide an estimate for future investments in water treatment facilities; (11) **tariffs on imports from Germany** can have severe impact on a company's profits and serve as an indicator for a country's openness to imported products. As Sea & Sun plans to establish a production facility in China, (12) the **tariffs for imports from China** were also examined; (13) legal protection of **property rights** reflects the degree to which the country's laws protect private property and how consequently these laws are enforced. It thereby indicates how well imported products with a patent are protected against replication.

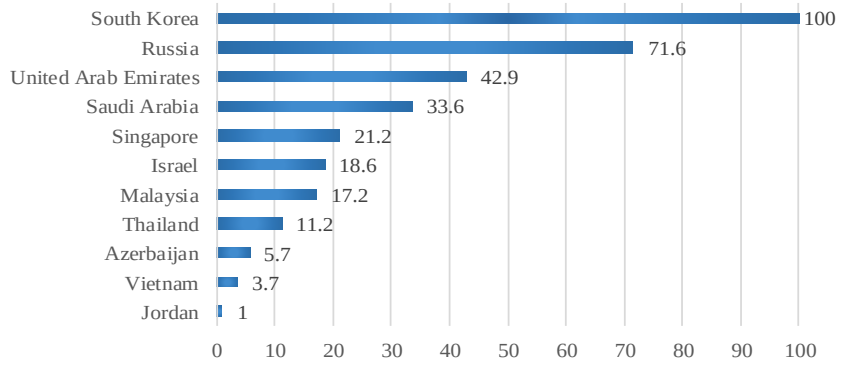
After collecting all relevant data, the variables were standardized to a scale from 1-100 (Appendix 12), based on Cavusgil et al. (2004) (Appendix 13). Thereby a country with the most favorable attribute of an indicator received a score of 100, whilst the country with the least favorable attribute was assigned a score of 1. This approach prevents artificial weighting and minimizes scale effects. Before standardization, the variables "(…) improved drinking-water sources" and "(…) improved sanitation facilities" as well as both variables for "tariffs on imports" were reversed, as lower percentages of drinking-water sources and sanitation facilities offer higher potential for market growth and higher tariffs have a negative impact on exporting activities.

Figure 3 – Distribution of weights

Level	Indicator	Weight
Macro 25%	Index of Economic Freedom	3%
	Trade Freedom	2%
	Country Risk	3%
	Foreign Exchange Risk	2%
	Urban Population	6%
	CAGR Population (1960 - 2015)	5%
	Legal protection of property rights	4%
Micro 75%	R&D expenditure	25%
	Number of researchers	20%
	Population using improved drinking-water sources	5%
	Population using improved sanitation facilities	5%
	Tariffs on imports of measuring instruments from Germany	10%
	Tariffs on imports of measuring instruments from China	10%

Based on the model of Cavusgil et al. (2004), specific **weights were allocated** to the indicators (Figure 3). The attribution was based on (i) the previously presented internal and external analysis and information obtained through interviews with the firm's management, (ii) correlations between the variables (Appendix 14), and (iii) further conducted research. Thus, a certain level of subjectivity is applied. In a last step, an overall score for each country was calculated by standardizing the sum of the individual scores as well. The final scores are depicted in Figure 4.

Figure 4 – Country Scores



South Korea performed only fourth on macro-, but best on micro-indicators. This is due to high spending on R&D and a high number of researchers in the country. From Sea & Sun's past experience, R&D expenditure is one of the most important indicators as sales decrease if research funds are reduced. Therefore, the highest weight was applied to this factor. As the firm successfully operates in several foreign countries with low scores on macro-factors, the management wanted to apply only small weights to them, resulting in rather unstable countries like Russia and Saudi Arabia scoring higher than considerably stable countries like Singapore and Israel, because of larger sales potential in their markets.

DETAILED COUNTRY ANALYSIS OF SOUTH KOREA

To obtain a better understanding of South Korea's situation, a detailed country analysis was conducted to confirm it to be a suitable market for Sea & Sun and to choose a favorable entry mode.

Macro-Economic Analysis (PESTLE)

The PESTLE framework presented in Figure 5 identifies macro-economic factors which Sea & Sun has to take into consideration as they might influence South Korea's industry (Appendix 15).

Figure 5: PESTLE Analysis for South Korea

Political	• Presidential republic, with strong democratic principles • Voice and Accountability rank: #69; Political Stability and Absence of Violence rank: #52 • Tense political relationship to North Korea and Japan • Presidential corruption scandal in 2016 lead to further political uncertainty • Member of UN and OECD
Economical	• 4th biggest economy in Asia • Strong economic growth expected next year • Member of the WTO; network of trade agreements with 58 countries and the EU • Strong trade imbalance, highly dependent on exports • Inhibited consumption in the market due to high household debt • Favorable business environment: #5 in Ease of Doing Business Index
Social	• Aging population due to low population growth and fertility rates • Functioning labor and welfare system • Low inequality within population regarding life expectancy, education and income • High adult education level: over 45% of adults with tertiary education level
Techno-logical	• Highest R&D expenditures in OECD • High receptiveness to new technologies
Legal	• Moderately effective system - protection of property rights score: 70; Strength of Legal Rights: 5 • Effective and transparent regulations for doing business: setting up a business requires 2 procedures and is completed within 4 days
Environ-mental	• Rather poor environmental performance: Environmental Performance Index rank #80 • Strong air pollution issues: Ranked #174 • Environmental laws and activities enforced to reduce emissions • Strong adoption of nuclear power to reduce emissions has lead to nuclear waste storage problem

Industry Analysis

In absence of country specific data on the water measurement instrumentation industry in South Korea, general R&D expenditures and waste water treatment are examined to estimate the **market**

size and **growth**: As South Korea is a highly developed country, all citizens are connected to improved drinking-water sources and sanitation facilities. Since current population growth is 0.1%, almost no further growth in building sanitation facilities like sewage treatment plants is expected. However, South Korea has 3,757 sewage treatment plants with a capacity to process 25 million m^3 waste water per day, which might be interested in equipping the facilities with (new) measuring probes. However, the industry's largest customer group are researchers in institutes or universities who depend on governmental R&D investments. R&D expenditures are comparably high in South Korea with investments of $ 76.34 billion. Of these, $ 20.16 billion are government funds with $ 0.33 billion invested in the exploration of the earth and $ 0.474 billion devoted to environmental research, both fields in which water testing probes are applied. These research funds are expected to slightly increase during the next 5 years. (Korean Statistical Information Service, 2016a)

Concerning **consumers**, next to the sewage treatment plants, there are 347,875 researchers in South Korea. 8.6% of them work at one of 348 research institutes, 30.9% perform at one of 371 universities and 60.5% are employed at one of 29,392 business enterprises performing R&D (Korean Statistical Information Service, 2016b). Another potential consumer group is the comparably large South Korean fishing industry, with an annual production of 3,304,800 tons (Statista, 2014).

Regarding **competition** and **distribution channels**, the market can be considered to be very similar to other markets worldwide as it is very concentrated. Both of Sea & Sun's major competitors, Sea-Bird Electronics and RBR, are already present and there are no other known local players in the market. Both competitors distribute their products via local agents, who help to sell the measuring probes directly to the end-customer. Even though this situation means competition to Sea & Sun, it is a market structure, which the company is familiar with and has experience in. Further, it shows a current need for the industry's products and that certain distribution networks already exist.

Entry Mode

As outlined before, there are three types of entry modes: exporting, non-equity-based and equity-based methods. The most suitable way for Sea & Sun to enter the South Korean market is by **directly exporting through a local agent**. The firm mainly exports its products directly to foreign markets, specifically to domestic agents. One exception is in place in France, where the company operates a sales subsidiary. As mentioned before, a production facility is also planned to be build up in China, due to the country's immense market size and prospects of high sales volumes due to the partnership with the Chinese governmental company. Overall, Sea & Sun has extensive experience in directly exporting its products and in finding trustworthy and suitable agents in foreign markets. As Sea & Sun is still fairly small and does not possess many financial and managerial resources, this market entry mode has allowed the firm to (i) benefit from the local agent's market knowledge and distribution network and thereby (ii) reduce the costs related to finding suitable distribution channels. As this strategy has been very successful so far and Sea & Sun has gained experience in direct exporting, it should choose this entry mode for the South Korean market as well. Further, with plans to establish a production facility in China, next to the one in Germany, Sea & Sun will be likely to proceed exporting its products to other countries. As individual adaptation of products to the customers' specific needs is necessary, direct exporting via an **agent** is the most suitable option. Agents have direct relations with the buyers and have a better understanding of customers' needs. Because Sea & Sun has to distribute the products and provide after sales services itself, due to the complexity of the products and specific know-how, it is no disadvantage to the firm, that agents do not provide these services. As can be seen with Sea & Sun's major competitors, it is common practice in the industry to have sales agents in South Korea, since extensive market knowledge is crucial. By using agents, Sea & Sun can ensure high standard customer service and has high control over its distribution channel and marketing strategy.

Financial Analysis

Currently, Sea & Sun has spare capacity of 63%. Yet, the deal with the Chinese company will absorb all of this in the near future. Therefore, Sea & Sun plans on entering new foreign markets only after a new production facility has been built in China. As the company will anticipate new market entries and plans for additional spare capacity in the new plant, there is no capacity investment required specifically for the South Korean market. Also, there is no need to hire additional personnel as operations will be directed from the headquarter in Germany and the planned subsidiary in China. However, further costs have to be taken into consideration. When directly exporting to South Korea, a commission of 10-15% of the sales price is distributed to the agent. Whilst imports from the European Union are free of charge, measuring instruments imported from China apply to tariffs of 8%. Thus, Sea & Sun could consider to ship products from Germany free of charge, in case shipping costs are lower than the 8% tariffs. In addition, South Korea and China agreed on a free trade agreement, stating that 90% of trades will be free from tariffs until 2024. In order to protect its intellectual property, the firm may want to invest in patents or registering its trademark. As marketing is primarily done by the local agent, marketing expenses for Sea & Sun comprise costs for the attendance of trade fairs and business trips to establish and cultivate relationships with the agent and certain local customers. However, those trips can be combined with visits to other markets in the region (e.g. Japan) to reduce costs. Therefore, no large investments specific to the market entry in South Korea and limited fixed costs for operations are expected. Due to the nature of the products, pricing is generally similar between world markets. Products are sold at list prices plus the agents' commission. Therefore, similar margins to other foreign markets are expected, at around 40%. In addition, Sea & Sun aims at reducing production costs due to economies of scale once the production facility in China is established. Due to these factors, exporting operations to South Korea are expected to have a positive impact on Sea & Sun's business.

Risk Analysis

When deciding to start international operations in South Korea, Sea & Sun needs to be aware of potential risk factors that may affect the success of the venture and therefore the company's profits: (i) **competition risk** – as both major competitors are already present in the market, it could be difficult to capture market share. However, Sea & Sun successfully competes with Sea-Bird Electronics and RBR in most other markets and has experience in dealing with this situation. Further, its products' prices are substantially lower than its competitors' at same or higher quality and technology, which facilitates the process of finding new customers and gaining market share; (ii) **replication risk** – if Sea & Sun does not patent its technologies, they might be imitated by others; (iii) **agent risk and low brand awareness** – as Sea & Sun will be new in the South Korean market and as it is a small company compared to its competitors, customers' brand awareness might be very low. To overcome this, the firm is dependent on a good sales agent with a large network and the relevant skills to market Sea & Sun's products to customers. Past market entries have shown, that the company's management is well capable of finding suitable and reliable sales agents in foreign markets; (iv) **economic risk** – South Koreas' economy is slightly weakened and forecasted GDP growth rates for 2016 and 2017 were revised downwards. However, expected growth rates of 2.7% (2016) and 2.8% (2017) can still be evaluated positively (Germany Trade & Invest, 2016). In addition, investments in R&D are comparably high, which is one of the most important market factors for Sea & Sun. Further, R&D expenditures are expected to remain constant or even raise slightly in the next 5 years; (v) **capacity risk** – as Sea & Sun is planning to build the new production facility in China before entering the South Korean market, delays during construction will directly affect market entry. Further, the company has to make sure to plan the facility to have appropriate capacity without increasing costs too much.

CONCLUSION AND RECOMMENDATIONS

The conducted analyses suggest South Korea to be the most suitable target market for Sea & Sun in Asia. The most appropriate mode of entry for the company to enter the chosen market was evaluated to be direct exporting via a local agent. However, as suggested by Cavusgil (1985), the company is advised to further conduct an in-depth analysis by collecting primary data of the market to estimate Sea & Sun's sales potential. This way the venture's break-even point can be determined and estimated, how much production capacity will be necessary for the South Korean market, which should be taken into consideration when planning the new production facility in China.

In addition, further recommendations are given for Sea & Sun to consider in order to mitigate risk related to entering the South Korean market and to take advantage of market opportunities. The company should formulate strategic and financial objectives which it seeks to attain. Further, it should develop a marketing strategy, to increase brand awareness in the market, and a monitoring system to measure performance in South Korea. When selecting an agent to distribute the firm's products, various characteristics are of relevance, including the agent's knowledge of and experience in the local market as well as an extensive business network and an applicable marketing strategy. In order to find such an agent, Sea & Sun can leverage its founder's network or existing relationships with agents in China and Japan. Sea & Sun could further attend South-East-Asian fairs like *Re-Tech* for Recycling and Waste Management in Seoul, or the *System Control Fair* for Measurement and Control in Tokyo to establish business contacts. Further, the firm should consider to patent its technologies to protect them from being replicated by others. The relative strong enforcement of property rights in South Korea would ensure such an investment to be worthwhile.

If Sea & Sun is willing to test the waters in South Korea by conducting further research and following these recommendations, a well prepared market entry should yield success.

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